

In the Claims:

Please cancel claims 2-3, 8 and 10-11, without prejudice, amend claims 1, 4-7, 9, and 12-16, and add new claims 17-19 as follows:

1. (Currently amended) A position demodulating method of a disk apparatus, for calculating a decoded position after position signals of a disk read by a head were demodulated, comprising:

a first step wherein after position information of different phases are demodulated from said position signals, they are multiplied by a position sensitivity gain, respectively, and first position information PosN and second position information PosQ are calculated;

a second step wherein said first position information PosN and said second position information PosQ are compared and third position information Pos1 and fourth position information Pos2 in which influences of an error of the position sensitivity gain appear oppositely are calculated; and

a third step wherein a first weight gain G1 and a second weight gain G2 are obtained from said third position information Pos1 and said decoded position is calculated by including an addition value of a multiplication value obtained by multiplying said third position information by said first weight gain and a multiplication value obtained by multiplying said fourth position information by said second weight gain;

wherein said first weight gain is a segment primary function which changes

like a triangle for a detected position so as to be equal to 1 at a track center and 0 at track boundary positions on both sides.

2-3. (Cancelled)

4. (Currently amended) ~~A method according to claim 1,~~A position demodulating method of a disk apparatus, for calculating a decoded position after position signals of a disk read by a head were demodulated, comprising:

a first step wherein after position information of different phases are demodulated from said position signals, they are multiplied by a position sensitivity gain, respectively, and first position information PosN and second position information PosQ are calculated;

a second step wherein said first position information PosN and said second position information PosQ are compared and third position information Pos1 and fourth position information Pos2 in which influences of an error of the position sensitivity gain appear oppositely are calculated; and

a third step wherein a first weight gain G1 and a second weight gain G2 are obtained from said third position information Pos1 and said decoded position is calculated by including an addition value of a multiplication value obtained by multiplying said third position information by said first weight gain and a multiplication value obtained by multiplying said fourth position information by said second weight gain;

wherein said first weight gain is a segment primary function which changes like a triangle for a detected position which is set to 1 at a track center and which is restricted to a lower limit value 0.5 at a position near a switching position of said position information PosN and PosQ on both sides.

5. (Currently amended) ~~A method according to claim 1,~~A position demodulating method of a disk apparatus, for calculating a decoded position after position signals of a disk read by a head were demodulated, comprising:

a first step wherein after position information of different phases are demodulated from said position signals, they are multiplied by a position sensitivity gain, respectively, and first position information PosN and second position information PosQ are calculated;

a second step wherein said first position information PosN and said second position information PosQ are compared and third position information Pos1 and fourth position information Pos2 in which influences of an error of the position sensitivity gain appear oppositely are calculated; and

a third step wherein a first weight gain G1 and a second weight gain G2 are obtained from said third position information Pos1 and said decoded position is calculated by including an addition value of a multiplication value obtained by multiplying said third position information by said first weight gain and a multiplication value obtained by multiplying said fourth position information by said second weight gain;

wherein said first weight gain is a segment primary function which changes like a trapezoid for a detected position which is set to 1 at a position in front of a switching position of said position information PosN and PosQ on both sides from a track center and which is restricted to a lower limit value 0.5 at a position near said switching position.

6. (Currently amended) ~~A method according to claim 1,~~A position demodulating method of a disk apparatus, for calculating a decoded position after position signals of a disk read by a head were demodulated, comprising:

a first step wherein after position information of different phases are demodulated from said position signals, they are multiplied by a position sensitivity gain, respectively, and first position information PosN and second position information PosQ are calculated;

a second step wherein said first position information PosN and said second position information PosQ are compared and third position information Pos1 and fourth position information Pos2 in which influences of an error of the position sensitivity gain appear oppositely are calculated; and

a third step wherein a first weight gain G1 and a second weight gain G2 are obtained from said third position information Pos1 and said decoded position is calculated by including an addition value of a multiplication value obtained by multiplying said third position information by said first weight gain and a multiplication value obtained by multiplying said fourth position information by said second weight gain;

wherein said first weight gain is a curve function which changes for a detected position which is set to 1 at a position in front of a switching position of said position information PosN and PosQ on both sides from a track center and which is restricted to a lower limit value 0.5 at a position near said switching position.

7. (Currently amended) A method according to claim 14, wherein
~~said first weight gain is a segment primary function which changes like a triangle for a detected position which is set to 1 at a track center and which is restricted to a lower limit value 0.5 at a position near a switching position of said position information PosN and PosQ on both sides, and~~

said first weight gain is determined with reference to said segment primary function by said third position information in which saturation characteristics have been corrected.

8. (Cancelled)

9. (Currently amended) A position demodulating circuit of a disk apparatus, for calculating a decoded position after position signals of a disk read by a head were demodulated, comprising:

a first circuit unit which demodulates position information of different phases from said position signals, subsequently multiplies said position information by a position

sensitivity gain, respectively, and calculates first position information PosN and second position information PosQ;

a second ~~seireuit~~circuit unit which compares said first position information PosN with said second position information PosQ and calculates third position information Pos1 and fourth position information Pos2 in which influences of an error of the position sensitivity gain appear oppositely; and

a third circuit unit which obtains a first weight gain and a second weight gain from said third position information Pos1 and calculates said decoded position by including an addition value of a multiplication value obtained by multiplying said third position information by said first weight gain and a multiplication value obtained by multiplying said fourth position information by said second weight gain;

wherein said first weight gain is a segment primary function which changes like a triangle for a detected position so as to be equal to 1 at a track center and 0 at track boundary positions on both sides.

10-11. (Cancelled)

12. (Currently amended) ~~A circuit according to claim 9,~~A position demodulating circuit of a disk apparatus, for calculating a decoded position after position signals of a disk read by a head were demodulated, comprising:

a first circuit unit which demodulates position information of different phases

from said position signals, subsequently multiplies said position information by a position sensitivity gain, respectively, and calculates first position information PosN and second position information PosQ;

a second circuit unit which compares said first position information PosN with said second position information PosQ and calculates third position information Pos1 and fourth position information Pos2 in which influences of an error of the position sensitivity gain appear oppositely; and

a third circuit unit which obtains a first weight gain and a second weight gain from said third position information Pos1 and calculates said decoded position by including an addition value of a multiplication value obtained by multiplying said third position information by said first weight gain and a multiplication value obtained by multiplying said fourth position information by said second weight gain;

wherein said first weight gain is a segment primary function which changes like a triangle for a detected position which is set to 1 at a track center and which is restricted to a lower limit value 0.5 at a position near a switching position of said position information PosN and PosQ on both sides.

13. (Currently amended) ~~A circuit according to claim 9;~~A position demodulating circuit of a disk apparatus, for calculating a decoded position after position signals of a disk read by a head were demodulated, comprising:

a first circuit unit which demodulates position information of different phases

from said position signals, subsequently multiplies said position information by a position sensitivity gain, respectively, and calculates first position information PosN and second position information PosQ;

a second circuit unit which compares said first position information PosN with said second position information PosQ and calculates third position information Pos1 and fourth position information Pos2 in which influences of an error of the position sensitivity gain appear oppositely; and

a third circuit unit which obtains a first weight gain and a second weight gain from said third position information Pos1 and calculates said decoded position by including an addition value of a multiplication value obtained by multiplying said third position information by said first weight gain and a multiplication value obtained by multiplying said fourth position information by said second weight gain;

wherein said first weight gain is a segment primary function which changes like a trapezoid for a detected position which is set to 1 at a position in front of a switching position of said position information PosN and PosQ on both sides from a track center and which is restricted to a lower limit value 0.5 at a position near said switching position.

14. (Currently amended) ~~A circuit according to claim 9,~~A position demodulating circuit of a disk apparatus, for calculating a decoded position after position signals of a disk read by a head were demodulated, comprising:

a first circuit unit which demodulates position information of different phases

from said position signals, subsequently multiplies said position information by a position sensitivity gain, respectively, and calculates first position information PosN and second position information PosQ;

a second circuit unit which compares said first position information PosN with said second position information PosQ and calculates third position information Pos1 and fourth position information Pos2 in which influences of an error of the position sensitivity gain appear oppositely; and

a third circuit unit which obtains a first weight gain and a second weight gain from said third position information Pos1 and calculates said decoded position by including an addition value of a multiplication value obtained by multiplying said third position information by said first weight gain and a multiplication value obtained by multiplying said fourth position information by said second weight gain;

wherein said first weight gain is a curve function which changes for a detected position which is set to 1 at a position in front of a switching position of said position information PosN and PosQ on both sides from a track center and which is restricted to a lower limit value 0.5 at a position near said switching position.

15. (Currently amended) A circuit according to claim 914, wherein
~~said first weight gain is a segment primary function which changes like a triangle for a detected position which is set to 1 at a track center and which is restricted to a lower limit value 0.5 at a position near a switching position of said position information~~

~~PosN and PosQ on both sides, and~~

said first weight gain is determined with reference to said segment primary function by said third position information in which saturation characteristics have been corrected.

16. . (Currently amended) A circuit ~~according to claims~~ as in claims 9, 12, 13 or 14, wherein said second circuit unit obtains a first speed correcting position and a second speed correcting position which are proportional to a moving speed of the head every said third position information Pos1 and said fourth position information Pos2 and adds them.

17. (New) A method as in claims 1, 4, 5 or 6, wherein with respect to said first weight gain, said second weight gain is set to a value obtained by subtracting the first weight gain from 1.

18. (New) A method as in claims 1, 4, 5 or 6, wherein in said second step, a first speed correcting position and a second speed correcting position which are proportional to a moving speed of the head are obtained every said third position information Pos1 and said fourth position information Pos2 and added.

19. (New) A circuit as in claims 9, 12, 13 or 14, wherein with respect to said first weight gain, said second weight gain is set to a value obtained by subtracting the first weight gain from 1.